START

0024941

9208237

Department of Energy
Richland Field Office
P.O. Box 550
Richland, Washington 99352

NOV 25 1992

92-LLB-001

Mr. David B. Jansen, P.E.
Hanford Project Manager
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Mr. Jansen:

FORECASTED DISPOSAL INVENTORY IN VAULTS 102-105

This letter is in response to a telecon question asked by Joe Witczak of your staff. Mr. Witczak inquired as to the total activity forecast to be disposed of in grout in vaults 102-105.

Attached are estimates for the amount of radionuclides forecast to be disposed of in vaults 102-105 (Attachment 1). A total of 14.6 million curies is expected to be disposed of in grout, presuming no significant change to the U. S. Department of Energy plans to process double shell tanks. The total activity including radioactive daughters is 28.7 million curies. Both of these values are decayed through December 1995.

A total of approximately 4.48 million curies (8.7 million curies (Mci) including radioactive daughters) is expected to be disposed of in vaults 102-105, again decayed through December 1995. Therefore, these vaults are projected to contain approximately 30% of the activity expected to be disposed of by the grout disposal program. Attachment 2 presents the activity estimates in tabular form.

From the mass balance presented by Don Wodrich (Attachment 3), the 1992 best estimate of 14.6 Mci represented 3.5% of the original material generated. Therefore, 4.48 Mci would represent approximately 1% of the material originally generated in this mass balance.

Should you have any questions, please contact me or your staff may contact Lori Huffman on 376-0104.

Sincerely,

Steve H. Wisness
Hanford Project Manager

Attachments (3)
cc w/atts: J. Witczak, Ecology
D. R. Duncan, EPA
J. L. Epstein, WHC
P. T. Day, EPA
B. A. Austin, WHC

VAULT 102

Candidate Tank: 241-AN-106

Tank Volume: 969,000 gallons expected pumpable (total volume 1,015,000 gallons)

Blending Required: None from other tanks

Materials in Tank:

* The contents of 106AN are composed of two strata: high sulfate waste and high phosphate waste, both of which are from N Reactor decontamination.

* The plan is to pump from the bottom to avoid mixing the strata within 106AN (cooler temperature, gelling); then , use the in-tank mixer in 102AP to mix well before the record sample is taken for final characterization and to assure that the feed that goes to the Grout Treatment Facility remains acceptable.

* Sampled/Characterized in 5/89.

Approximate Radionuclide Inventory: (Decayed to December 31, 1995)
(in expected pumpable volume)

*	Cs 137.....	644,100 Curies
*	Sr 90.....	7,000 Curies
*	Tc 99.....	250 Curies
*	Total with daughters.....	1,268,000 Curies

VAULT 103

Candidate Tank: 241-AW-101

Tank Volume: Approximately 1,125,000 gallons; of this, 740,000 gallons will be used in Vault 103.

Blending Required: Yes. 260,000 gallons of dilute, non-complexed waste from tank 241-AP-106. The total activity from that volume is approximately 67,000 curies including daughters.

Materials in Tank:

* Other than 54,000 gallons of dilute waste which was already in the tank, over a million gallons of DSSF was placed in the tank from the 242-A Evaporator. That material is primarily made up of Purex waste and a very small amount of salt well liquids. It does contain some nitrates and sodium and is being blended to obtain specified Cs concentration for heat loading purposes.

* Sampled/Characterized in 6/90.

Approximate Radionuclide Inventory: (Decayed to December 31, 1995)

* Cs 137..... 1,500,000 Curies
* Sr 90..... 7,186 Curies
* Tc 99..... 440 Curies
* Total with daughters..... 2,580,000 Curies

VAULT 104

Candidate Tank: 241-AW-101 and 241-AP-105

Tank Volume: The remainder of 241-AW-101 supernatant liquids (approximately 265,000 gallons) will be transferred into tank 241-AP-105 which currently contains 824,000 gallons; of this, 1,036,000 gallons will be transferred to tank 241-AP-102 as feed in vault 104.

Blending Required: Yes. 265,000 gallons of DSSF from 241-AW-101 is to be mixed with dilute DSSF in tank 241-AP-105.

Materials in Tank:

* Wastes contained in tank 241-AW-101 are as described for Vault 103.
* Wastes contained in tank 241-AP-105 are the product of partial evaporation in the 242-A Evaporator of PUREX miscellaneous and B-Plant miscellaneous waste streams. The waste was the product of the latest evaporation. That evaporation (90-1) was halted before completion yielding a waste which formed of similar components but not concentrated to the levels of other DSSF wastes.
* Sampling scheduled for April 1993. Estimates are based upon evaporator process sampling.

Approximate Radionuclides Inventory:

*	Cs 137.....	1,158,000 Curies
*	Sr 90.....	1,440 Curies
*	Tc 99.....	202 Curies
*	Total with daughters.....	2,260,000 Curies

VAULT 105

Candidate Tank: 241-AN-104

Tank Volume: 800,000 gallons. Of this, 450,000 gallons will go into Vault 105.

Blending Required: Yes. Tank 241-AP-106 will contribute 550,000 gallons. AP-106 is a dilute non-complexed waste as described under Vault 103.

Materials in Tank:

* Wastes contained in tank 241-AW-101 are as described for vault 103.
* Wastes contained in tank 241-AP-105 are the product of partial evaporation in the 242-A Evaporator of PUREX miscellaneous and B-Plant miscellaneous waste streams. The waste was the product of the latest evaporation. That evaporation (90-1) was halted before completion yielding a waste which formed of similar components but not concentrated to the levels of other DSSF wastes.
* Sampling is scheduled for February 1994. Estimates are based upon evaporator process sampling.

Approximate Radionuclide Inventory: (Decayed to December 31, 1995)

*	Cs 137.....	1,294,000 Curies	
*	Sr 90.....	23,400 Curies	
*	Tc 99.....	31+ Curies	(AN-104 contribution unknown)
*	Total with daughters.....	2,586,000 Curies	

ATTACHMENT 2

Decay Date	Waste Disposal Plan (Current Estimate)					
12/31/95	Volume(kgal)	Activity (Ci)			Total	
Vault 102		90Sr	99Tc	137Cs	w/o d.[1]	w/ d.
105-AN	968	6,944	254	644,100	651,480	1,267,743
Vault 103						
101-AW	742	2,669	427	1,287,686	1,291,984	2,512,303
106-AP	258	3,526	15	30,476	34,536	66,892
					1,326,519	2,579,695
Vault 104						
101-AW	252	907	145	437,517	438,978	853,776
105-AP	784	533	53	720,357	721,919	1,403,910
					1,160,897	2,257,686
Vault 105						
104-AN	453	15,890	0	1,229,593	1,264,738	2,443,823
106-AP	547	7,478	31	64,640	73,249	141,876
					1,337,987	2,585,699
Vaults 2-5						
Total	4,004	37,946	924	4,414,369	4,476,883	8,690,823

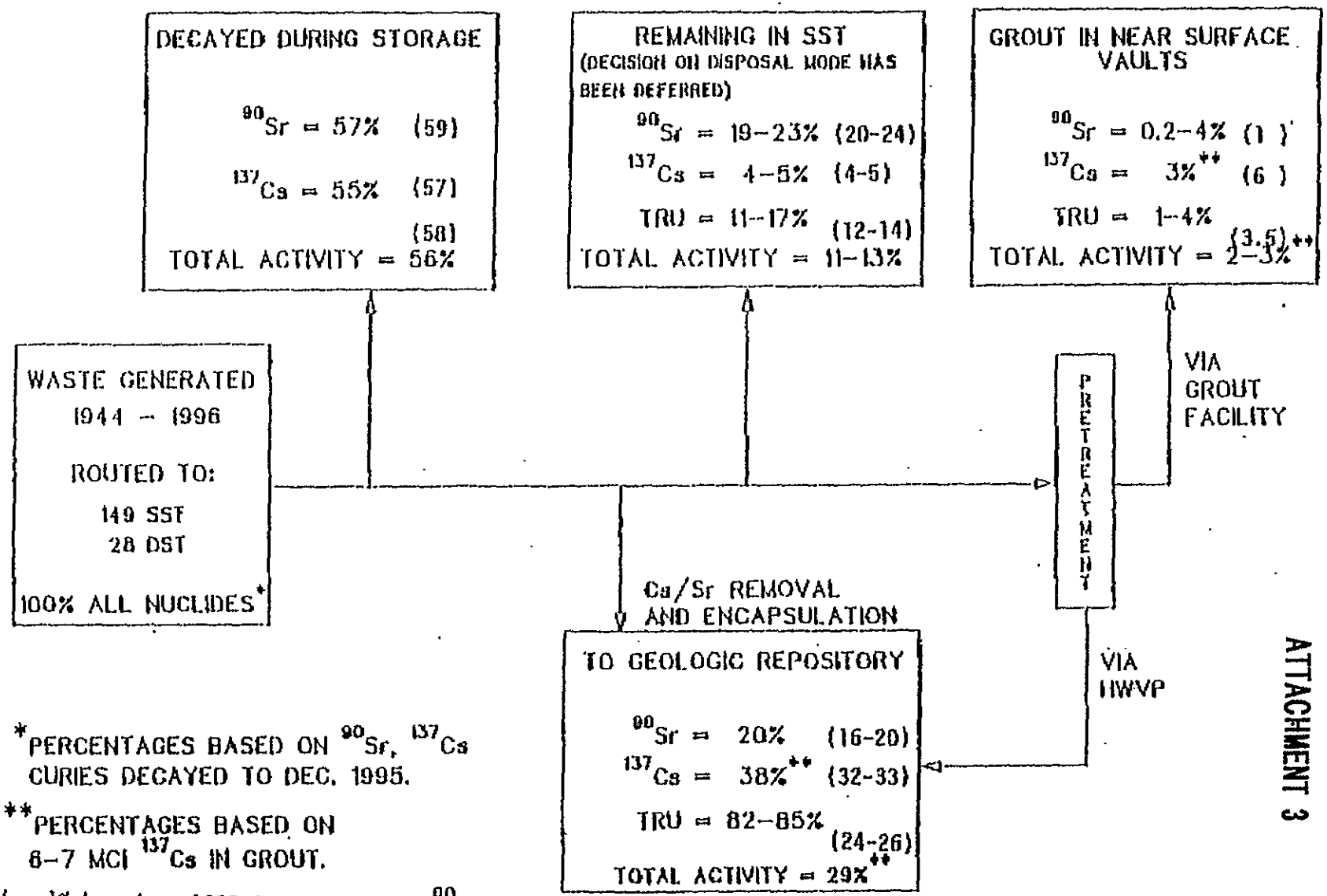
[1] "d." denotes radioactive daughters of ^{90}Sr and ^{137}Cs.

FIGURE 3

COMPARISON OF 1992 BEST ESTIMATE TO PREVIOUS NRC SUBMITTAL

RADIONUCLIDE MATERIAL BALANCE HANFORD TANK WASTE

IF ADDITIONAL ^{137}Cs REMOVED FROM COMPLEXANT CONCENTRATE



*PERCENTAGES BASED ON ^{90}Sr, ^{137}Cs CURIES DECAYED TO DEC. 1995.

**PERCENTAGES BASED ON 6–7 MCI ^{137}Cs IN GROUT.

( )% based on 1992 Best Estimate: ^{90}Sr 1.8 & ^{137}Cs 12.8 MCI in Grout

ATTACHMENT 3

LD1G92

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
S. H. Wisness, RL	D. B. Jansen, Ecology	Incoming: 9208237

Subject: FORECASTED DISPOSAL INVENTORY IN VAULTS 102-105

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	X
		President's Office		
		B. N. Anderson	G6-02	X
		B. A. Austin	B2-35	X
		T. D. Blankenship	R2-30	X
		S. L. Bradley	B3-06	
		J. L. Deichman	B1-59	X
		J. L. Epstein		X
		H. D. Harmon, Level 1	R2-52	X
		L. L. Humphreys, Assignee		X
		D. W. Lindsey	B2-35	X
		P. J. Mackey	B3-15	X
		H. E. McGuire	B3-63	
		D. J. Newland	S4-55	X
		J. H. Roecker	B1-59	X
		G. F. Williamson	R4-01	X
		R. F. Wood	R4-01	X
		D. D. Wodrich	R2-23	X
		TPA File (M-01)	B2-35	X
		EDMC	H4-22	X